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LIST OF ABBREVIATIONS

ANFIS	-	Adaptive Neuro-Fuzzy Inference System
AC	-	Alternative Current
ANN	-	Artificial Neural Network
AI	-	Artificial Intelligence
BPNN	-	Back-propagation Neural Network
CPNN	-	Counter propagation Neural Network
DT	-	Decision Tree
DC	-	Direct Current
DisCos.	-	Distribution Companies
DSA	-	Dynamic Security Assessment
EMS	-	Energy management System
ES	-	Expert System
FDLF	-	Fast Decoupled Load Flow
FIS	-	Fuzzy Inference System
FS	-	Fuzzy System
GenCos.	-	Generation Companies
ISO	-	Independent System Operator
IEEE	-	Institute of Electrical and Electronic Engineering
KB	-	Knowledge Base
KSOM	-	Kohonen Self Organizing Map
LS	-	Learning Set
ML	-	Machine Learning
MCP	-	Market Clearing Price
MSE	-	Mean Square Error
MF	-	Member Function
MLP	-	Multilayered Perception

NRLF	-	Newton Raphson Load Flow
OP	-	Operating Points
PR	-	Pattern recognition
PX	-	Power Exchange
RBF	-	Radial Basic Function
ResCo.	-	Retailer Companies
RMSE	-	Root Mean Square Error
SA	-	Security Assessment
SOM	-	Self Organizing Map
SSA	-	Static Security Assessment
SVM	-	Support Vector Machine
TSA	-	Transient Security Assessment
TransCos.	-	Transmission Companies
Vm	-	Voltage Magnitude

LIST OF SYMBOLS

i	-	Bus number
V_i	-	Voltage magnitude at bus i^{th}
$V_i^{(k)}$	-	Voltage magnitude at bus i^{th} and iteration k^{th}
$\Delta V_i^{(k)}$	-	Voltage magnitude residual at bus i^{th} and iteration k^{th}
$V_i^{(k+1)}$	-	The new estimates for bus voltage
δi	-	Phase angle at bus i^{th}
$\delta_i^{(k)}$	-	Phase angle calculated at bus i^{th} and iteration k^{th}
$\delta_i^{(k+1)}$	-	The new estimates for bus phase angle
$\Delta \delta_i^{(k)}$	-	Phase angle residual at bus i^{th} and iteration k^{th}
Pi	-	Real power injection at bus i^{th}
$\Delta P_i^{(k)}$, $\Delta Q_i^{(k)}$	-	Power residuals at bus i^{th} and iteration k^{th}
$P_i^{(k)}$	-	Real power calculated at bus i^{th} and iteration k^{th}
Qi	-	Reactive power injection at bus i^{th}
$Q_i^{(k)}$	-	Reactive power calculated at bus i^{th} and iteration k^{th}
Y_{ij}	-	Line admittance between bus i^{th} and j^{th}
ϵ	-	Error or specific accuracy
$_j$, i,k	-	Nodes at input, hidden and output layers(nodes)
O_j	-	The output of node j^{th}
O_i	-	The output of node i^{th}

O_k	-	The output of node k^{th}
w_{ij}	-	The weight connected between node i^{th} and j^{th}
w_{jk}	-	The weight connected between node j^{th} and k^{th}
θ_j	-	The bias of node j^{th}
θ_k	-	The bias of node k^{th}
d_{ij}	-	The j^{th} desired output for the i^{th} training pattern
y_{ij}	-	The corresponding actual output
$\mu_{\mathrm{A}}(x)$	-	A membership function of x
x_{m}	-	Input variables
A_{m}	-	Fuzzy sets
y	-	A constant or a linear function of the input variables
$x_i^{(2)}$	-	The input of neuron i^{th} in Layer2
$y_i^{(2)}$	-	The output of neuron i^{th} in Layer2
a_i, b_i and c_i	-	Parameters that control, respectively, the centre, width and slope of the bell activation function of neuron i^{th}.
$\mu 1$	-	The firing strength, or the truth value, of *Rule* 1